

Application No.: 09/817,682
Docket No.: JCLA5662-CIP

Summary of Applicant's Invention

The Applicant's invention is directed to an alignment mark configuration, wherein *a spacing between the trench and the alignment is five to eighty times the width ("d") of the flat spacing between the recesses*. When "D" is at least 5 times "d", the upper sidewall of the recesses 106a of the alignment mark 106 is prevented from being damaged during the step of global planarization by means of chemical mechanical polishing. Preferably, the spacing "D" is formed about 5d to 80d, more preferably, about 5d to 50d. The scattering of the incident light due to the damage induced to the upper sidewall of the recesses 106a is thereby prevented. As a result, the alignment mark can provide a clear alignment signal to the overlay detector to increase the alignment accuracy.

Response to 35 U.S.C. 102 (e) rejection

Claims 1-3 are rejected under 35 U.S.C. 102(e) as Komuro (US 5,949,145).

Applicants respectfully assert that Komuro is legally deficient for the purpose of anticipating claim 1 for at least the reason that Komuro fails to disclose every claimed feature of the present invention. More specifically, Komuro fails to disclose *"...a spacing between the trench and the alignment mark is in a range between about 5d to 80d"* as taught in Claim 1. Komuro discloses in Fig. 12 a semiconductor device comprising slits (alignment marks) 53a, 53b, 54a, 54b, 55a, 55b and trenches 52a, 52b. The Office Action, however, contends that Komuro teaches the distance between the trenches and the set of slits between 5d and 80d when d is the distance between the individual slits simply based on the relative spacing of the various elements illustrated on the schematic diagram of Figure 12. Applicants respectfully assert that Komuro anticipates the present invention based on the not-to-scaled drawings is unsubstantiated. The reason is stated as follows:

Applicants respectfully draw the attention of the Office to Column 9, lines 43-47 of the Komuor, which discloses that "W2 is set to 1.7 μ m when W1 is 0.3 μ m, the length L1 of the slit

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7a, 7b, 8a, 8b, 9a and 9b is set to $12\mu\text{m}$, the length L2 of the patterns 15, 16, and 17 is set to $12\mu\text{m}$, and the pitch P1 of the silts 7a, 7b, 8a, 8b, 9a and 9b is set to $6\mu\text{m}$ ". Therefore, *W2 is by rights at least 5 times W1, L1 is the same as L2, L1 is 36 times W1, and P1 is 20 times W1*. As very clearly shown in Figures 8 and 9, *W2 is 2 times W1, rather than at least 5 times; L1 is not the same as L2; L1 is 4 times W1, rather than 36 times; and P1 is 6 times W1, rather than 20 times*. In other words, the schematic diagrams of Komuor were not drawn according to scale.

Applicants respectfully draw the attention of the Office Action to a third embodiment of the Komuor in Column 12, lines 58-61, which discloses that "the edge of the silts 53a, 53b, 54a, 54b, 55a, and 55b serves as the main scale of a vernier caliper, and the edge of the patterns 61, 61, and 62 serves as the vernier scale thereof, and this is same as that shown in the first embodiment". According to the statement that W2 is set to $1.7\mu\text{m}$ when W1 is $0.3\mu\text{m}$ and the pitch P1 is set to $6\mu\text{m}$ recited in Column 9, lines 43-47 of the first embodiment of the Komuor, the width of the silts 53a, 53b, 54a, 54b, 55a, and 55b of Figure 12 is W1 and is $0.3\mu\text{m}$, the width of the patterns 60, 61 and 62 is set to W2 and is $1.7\mu\text{m}$, and the pitch P1 of the silts 53a, 53b, 54a, 54b, 55a, and 55b is set to P1 and is $6\mu\text{m}$. In other word, *the width of the patterns 60, 61 and 62 is at least 5 times that of the silt 53a, 53b, 54a, 54b, 55a, and 55b, the spacing between the silt 53a and 53b is 4 times of the width of the silt 53a. The pitch of the silts 53a, 53b, 54a, 54b, 55a, and 55b is 20 times the width of the silt 53a, 53b, 54a, 54b, 55a, and 55b*. As very clearly shown in Figure 12 of the Komuor, *the width of the patterns 60, 61 and 62 is 2 times that of the silt 53a, 53b, 54a, 54b, 55a, and 55b, rather than 5 times; the spacing between the silt 53a and 53b is smaller than the width of the silt 53a, rather than 4 times; and the pitch of the silts 53a, 53b, 54a, 54b, 55a, and 55b is 4 times the width of the silt 53a, 53b, 54a, 54b, 55a, and*

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55b, rather than 20 times. In other words, the schematic diagrams of Komuor were not drawn according to scale.

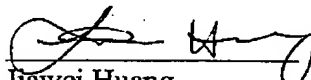
Since the schematic diagrams of Komuor were not drawn according to scale, "...a spacing between the trench and the alignment mark is in a range between about 5d to 80d" as taught in Claim 1 can not be derived from Figure 12 of Komuor by those skilled in the art. Therefore, the assertion that Komuor anticipates the present invention based on the not-to-scaled drawings is unsubstantiated. Withdrawal of the rejection and allowance of the presently pending claim are courteously requested.

CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 1-3 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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